

U.S. Pilot Labor Supply

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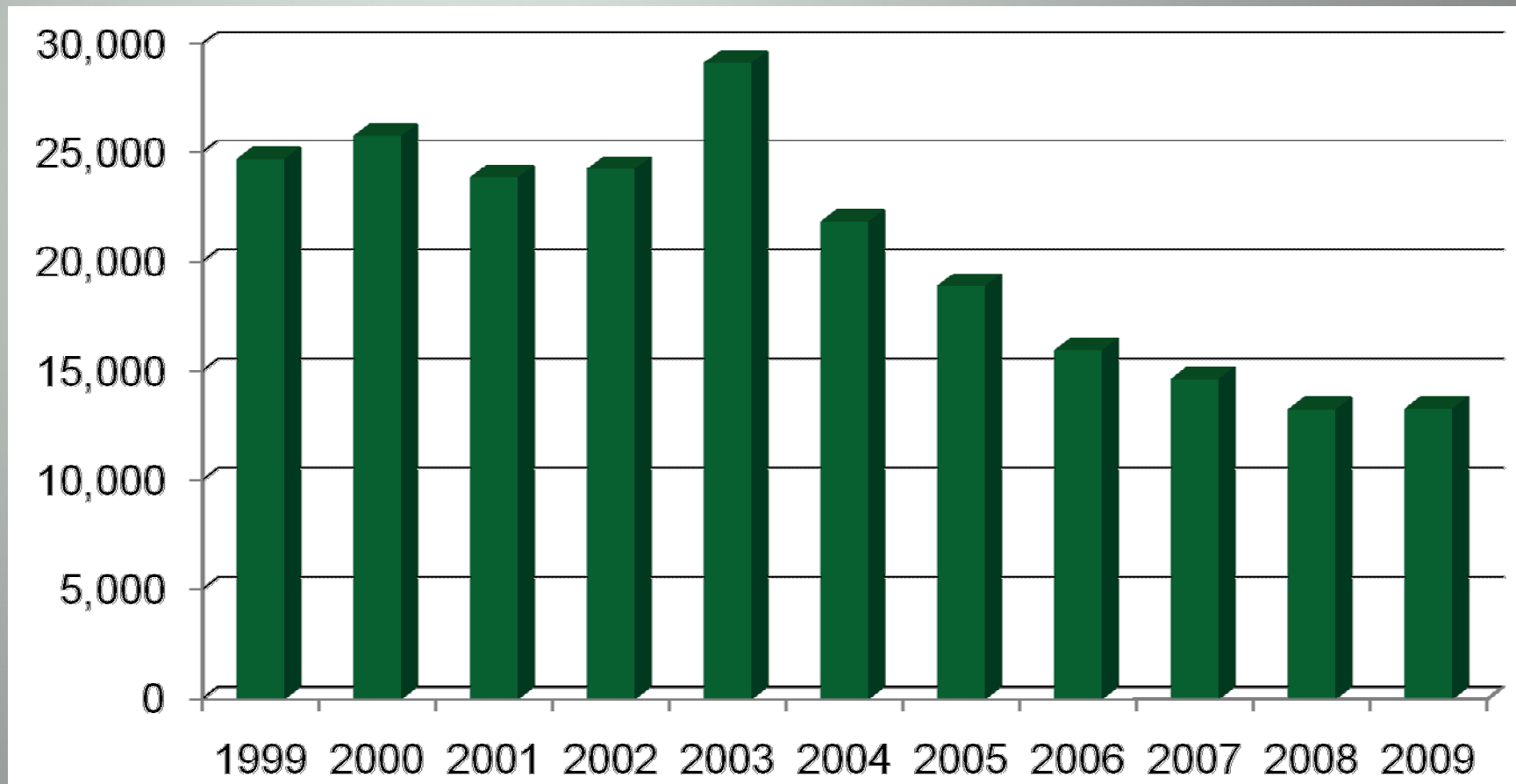


Trends in Students Interest in Aviation Careers

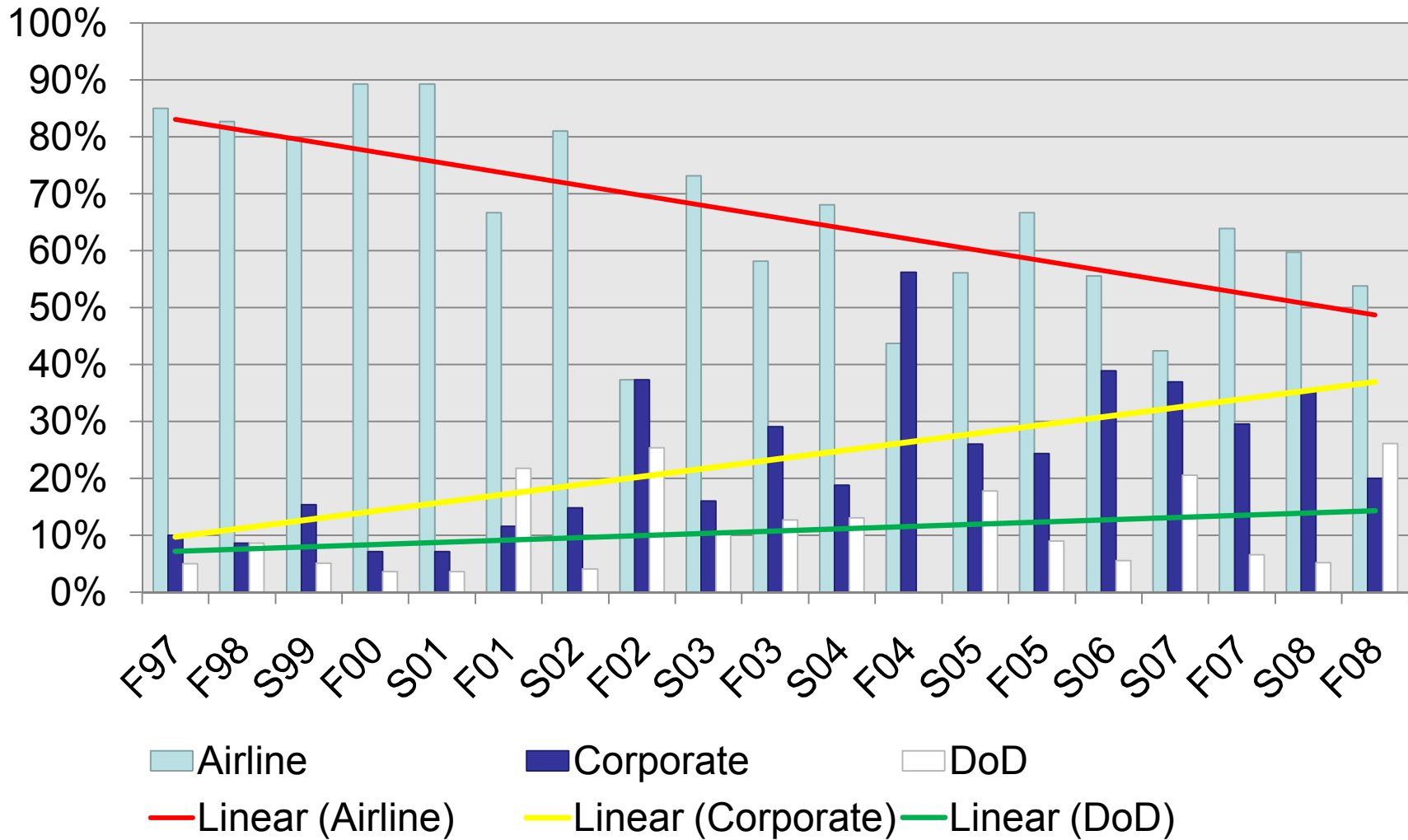
- Fewer Students interested in Aviation Careers
 - Airline distress and media coverage
 - Low pay entry level careers
- More students looking away from airline careers within aviation
 - Increasing costs
 - Increasing debt
 - Tightening of student loan market
 - Parents less able to help



Aviation Interested High School Juniors NRCCUA



Student Trends in Aviation Careers



Recent Survey of UND CFI's

- N = 173
- 56% (97) said they wanted to be airline pilots initially
- 60 of those no longer want to go that route
- Only 24% (42) out of 173 are considering an airline career



Trends in Pilot Supply

- U.S. has enjoyed a robust general aviation infrastructure providing a source of pilots
- Those days are ending - image and costs
- We saw a preview of this in 2007-08
 - Offers from regional airlines with only 300 hours of flight experience



What is pilot supply?

– Commercial Pilot

- Will need anywhere from 1-3 years to obtain
- Have around 200-250 hours of time
- Is the basic requirement for employment
- Competitive qualifications vary with market conditions

– Airline Transport Pilot (ATP)

- FAA requirement for Airline Captain positions
- 1500 hours of time
- 500 hours of X-C (50 nm) time
- Several years to obtain



Forecast Risks

- Unforeseen economic hardships
- Flight-Time/Duty-Time
- Company growth constraints
 - GHG caps
 - NextGen failures
- MPL
- UAS
- H.R. 3371 ATP Requirement

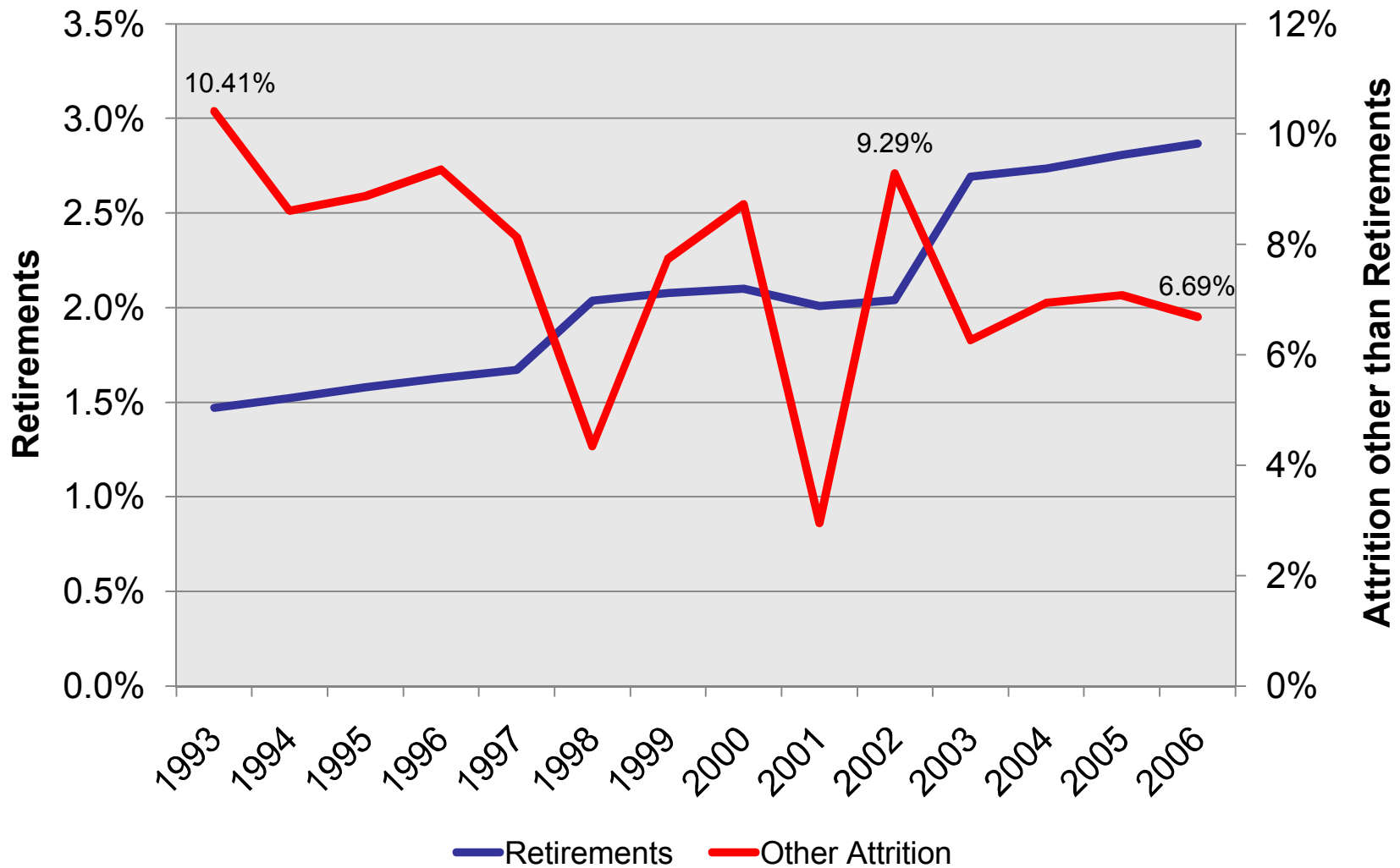


Pilot Supply Forecasts

- Factors affecting current active pilot supply
 - Attrition (8.94% annually)
 - Retirements (2.12% annually)
 - Other Attrition (6.82% annually, lowest rate 2.94%)
 - Loss of medical
 - Loss of certificate
 - Career transfer



Annual Pilot Attrition – Historical



UND Forecast Pilot Supply

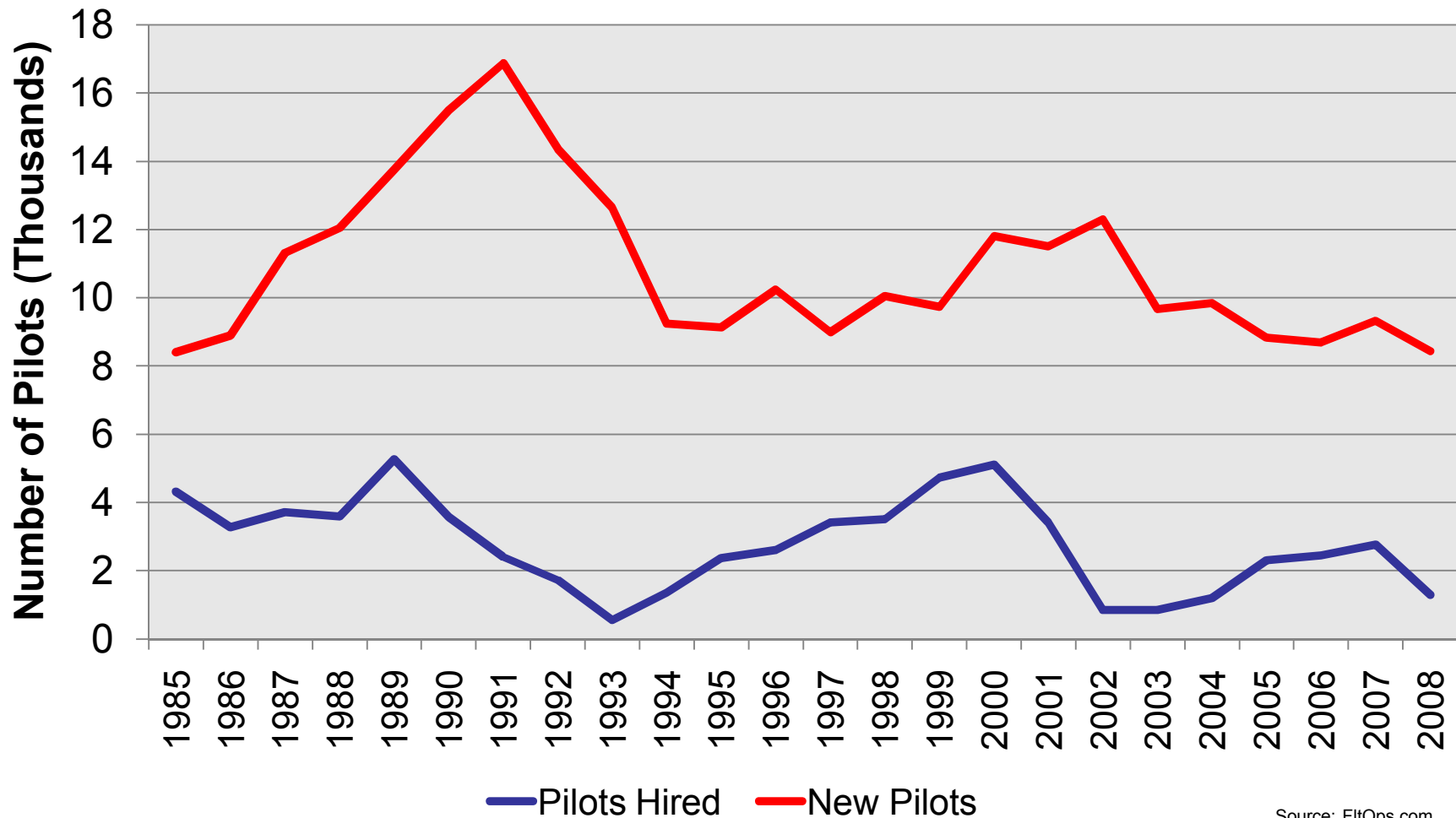
- The UND Pilots Supply Model
 - Entrance Barriers
 - Cost of initial flight training (Risk)
 - Current hiring at major airlines (Reward)
 - Other potential factors
 - Job Satisfaction
 - Prestige



- First predictor:
 - Hiring at major airlines
 - Source: fltops.com
 - Major airlines used: American, United, Delta, Southwest, Northwest, Continental, FedEx, UPS, JetBlue, American West, AirTran, Alaska, ATA, ABX Air



Historical Pilots Hired at Major Airlines vs. New Commercial Pilots Created



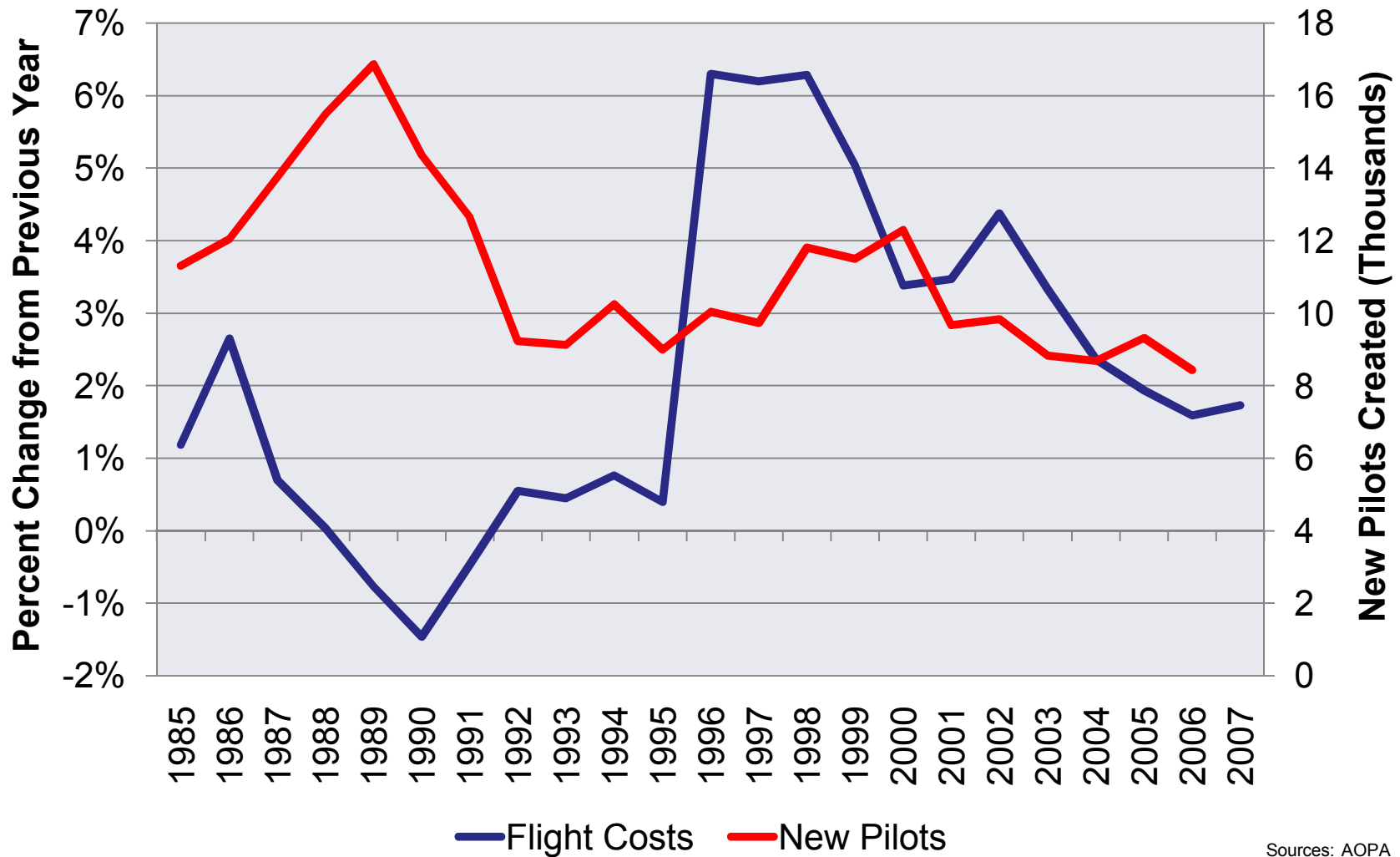
Source: FltOps.com,



- Second predictor:
 - Flight training costs
 - Source: AOPA
 - Based upon mean flight training cost per hour for a general aviation trainer with flight instructor
 - Several plots from survey, others interpolated
 - Adjusted for inflation (2007 dollars)
 - Actual metric used was year-over-year percentage increase/decrease



Flight Costs vs. New Pilots (2007 Dollars)



Sources: AOPA



- Computed Stepwise Multiple Regression Model
 - Predictors:
 - Risk (Cost of Flight Training)
 - Reward (Number of Pilots Hired at a Major Airline)

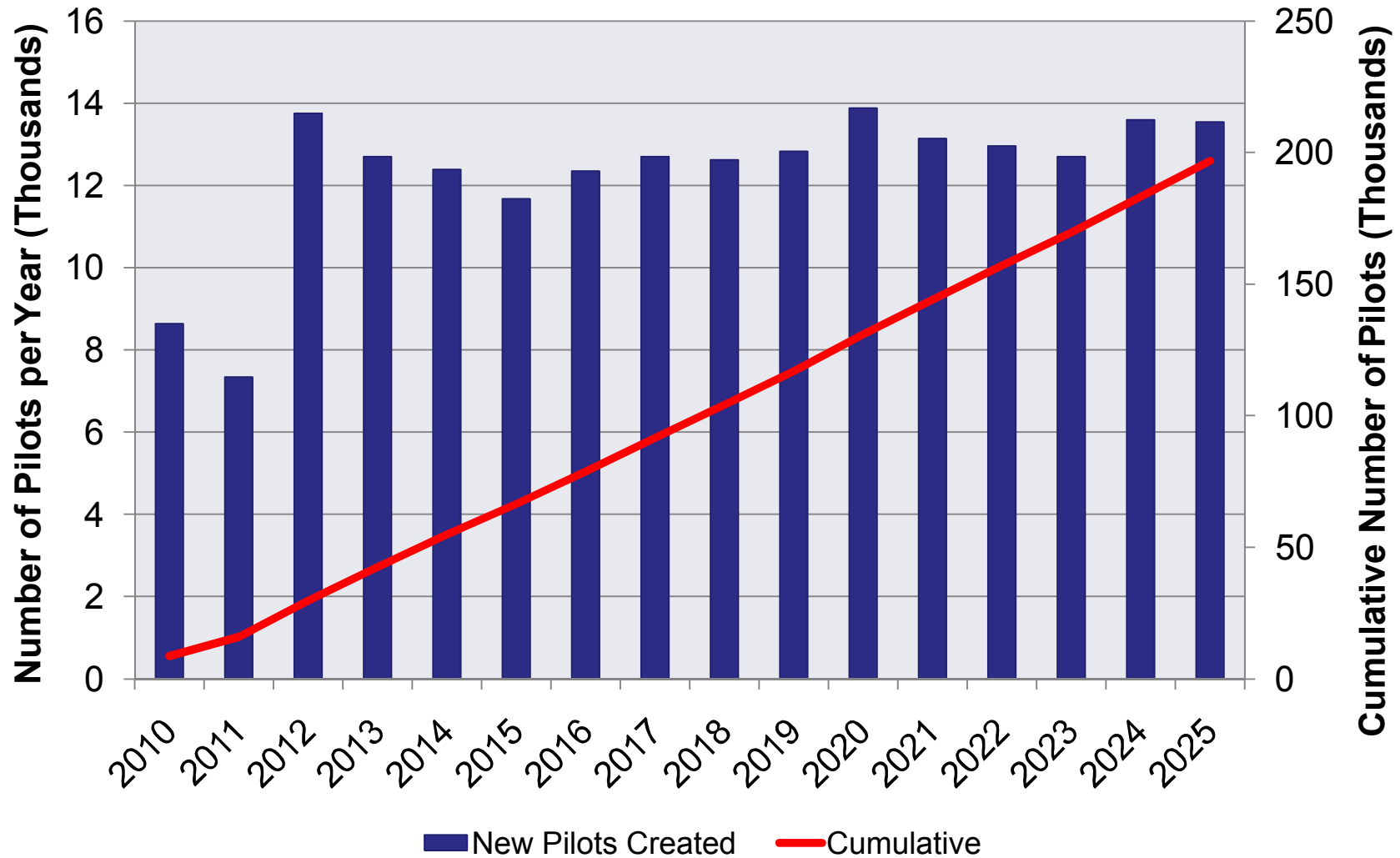
$$Y = 1.18(X) - 409(Z) + 8,643;$$

where y = New commercial pilots in 2 years
 x = Pilots hired at a major airline, and
 z = Percent change year-over-year in
 flight training costs

$$R^2 = .630, F(2, 19) = 16.182, p < .001$$



UND Forecast New Commercial Pilots 2010-2025



What about demand?



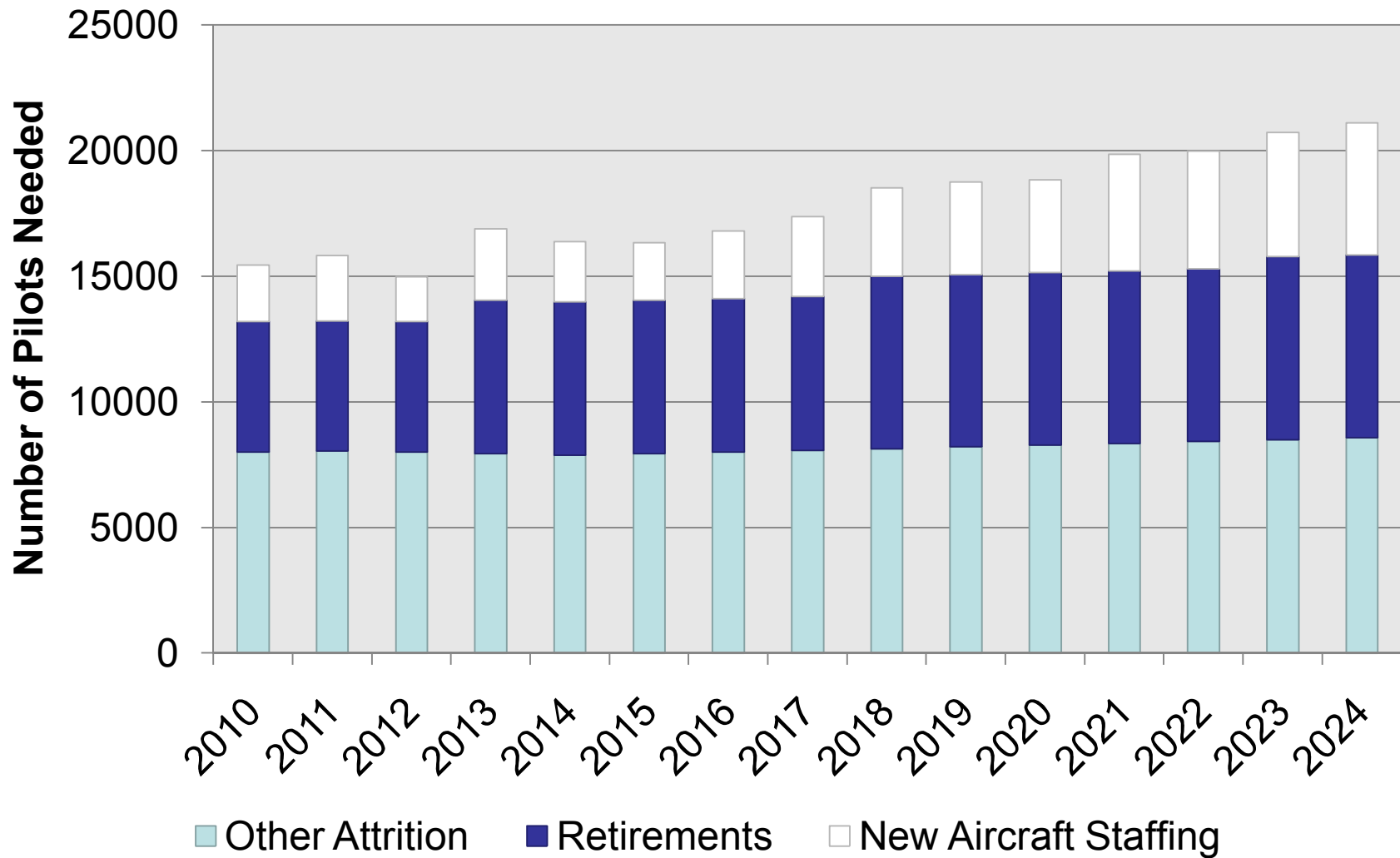
Long Term Forecast

Reason	New Pilots Required 2010-2025
Retirement	107,485
Aircraft Additions	54,358
Other Attritions*	139,197
Total	301,040

*Using the historic low rate of 2.94%



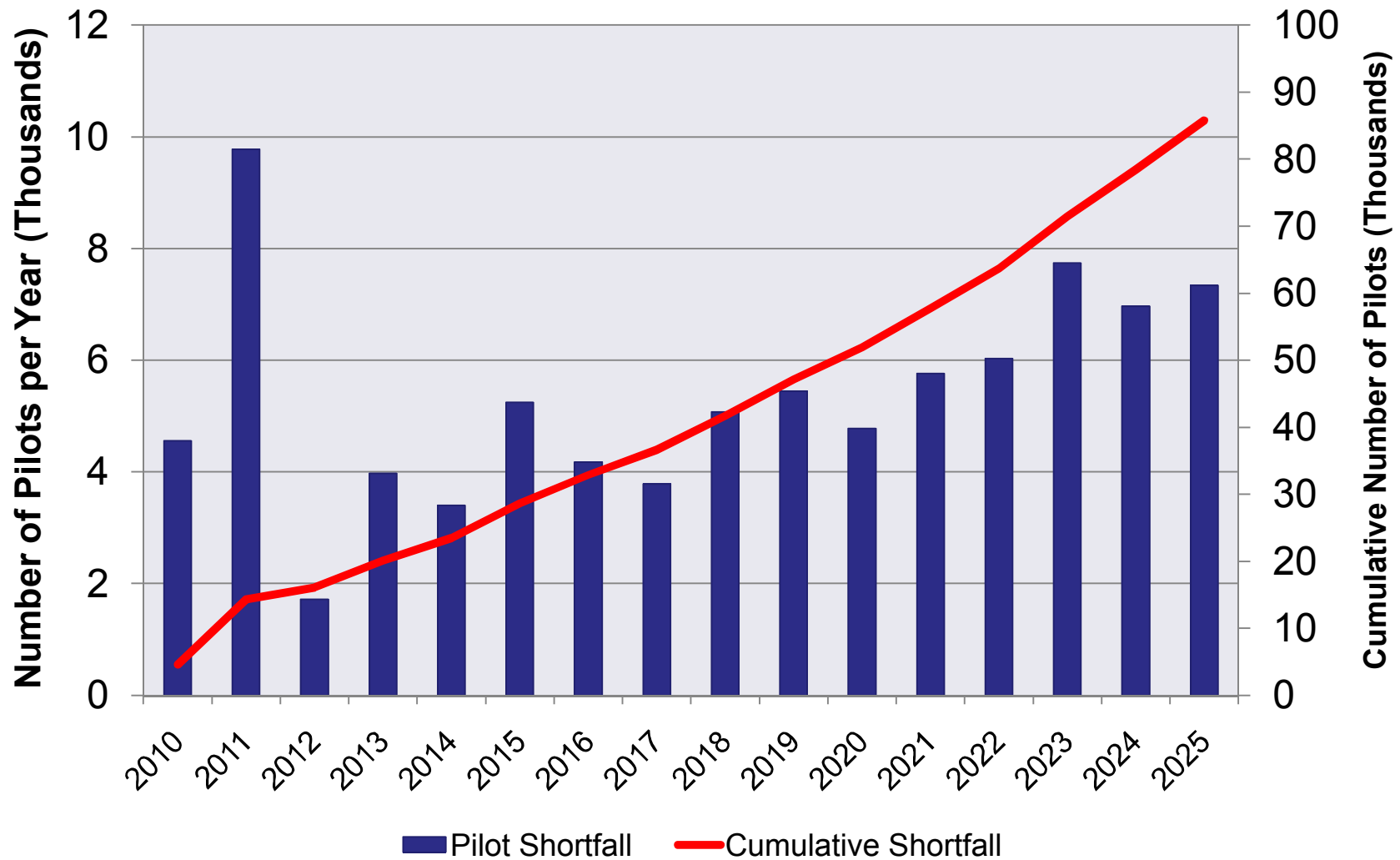
Forecast Pilot Demand per Year 2009-2024



- The UND Forecast Surplus/Shortfall
 - Supply derived from model
 - Demand derived from FAA forecast aircraft, retirements and other attrition
 - Forecast in a nutshell:
 - Between 2010 and 2025, there will be an 85,777 pilot shortfall



UND Forecast Pilot Shortfall 2010-2025



- There is also substantial worldwide pilot demand over the next 20 years
 - Many continents do not have infrastructure in place to train pilots
 - South America
 - Middle East
 - Africa
 - Asia
 - The United States and Europe will likely provide many of these pilots



Global Estimations of Pilot Needs 2009-2025

Aggregate Average of ICAO, Boeing, Airbus Forecasts



Source: ICAO, Boeing, Airbus



Mitigation Strategies

- Securing Supply
 - Airline industry must communicate that there is a future need
 - Airline involvement in student recruitment
 - Airline sponsored career path (JetBlue)
 - Airline sponsored scholarships/student debt retirement
 - Sponsored Ab Initio flight training



Concluding Remarks

- Pilot supply can be predicted using a risk-reward model
- Pilot demand is contingent upon new aircraft delivered into the market, retirements and other attrition
- All forecasts point to civilian pilot shortfalls
- Supply shortfall mitigation strategies should be implemented



Thank you!

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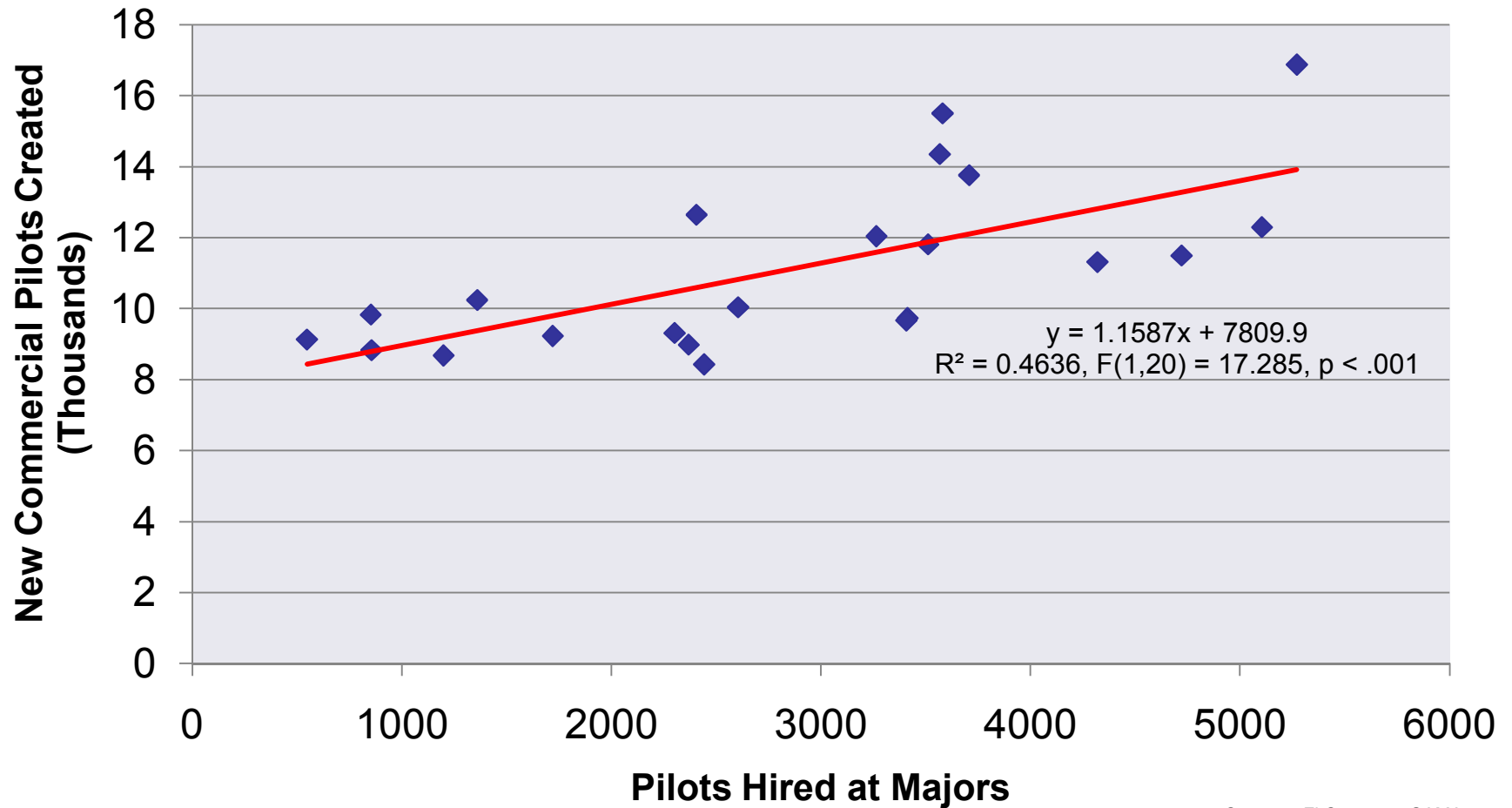
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Contingency Slides



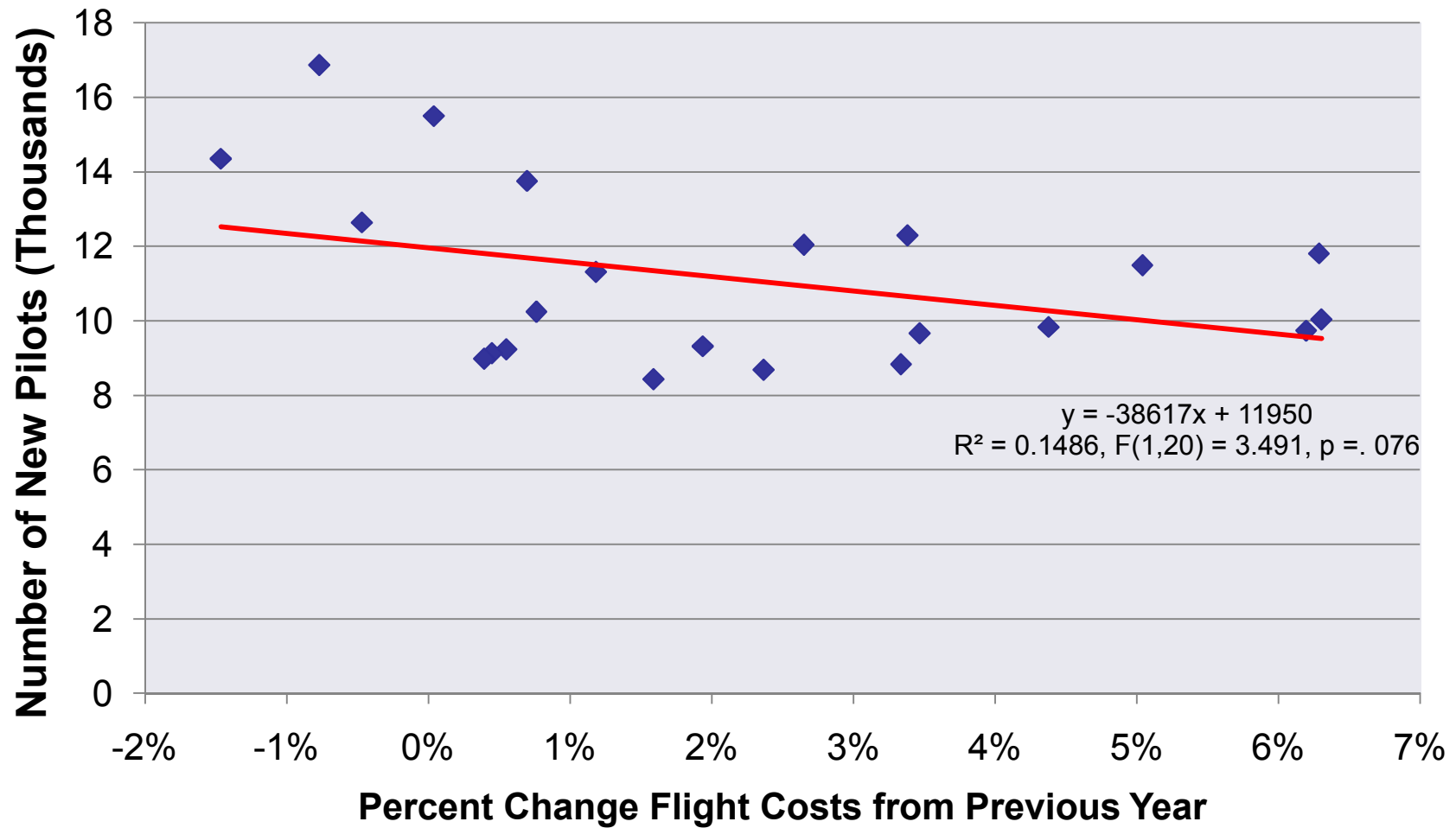
Historical Pilots Hired at Major Airlines vs. New Commercial Pilots Created 2 years Later



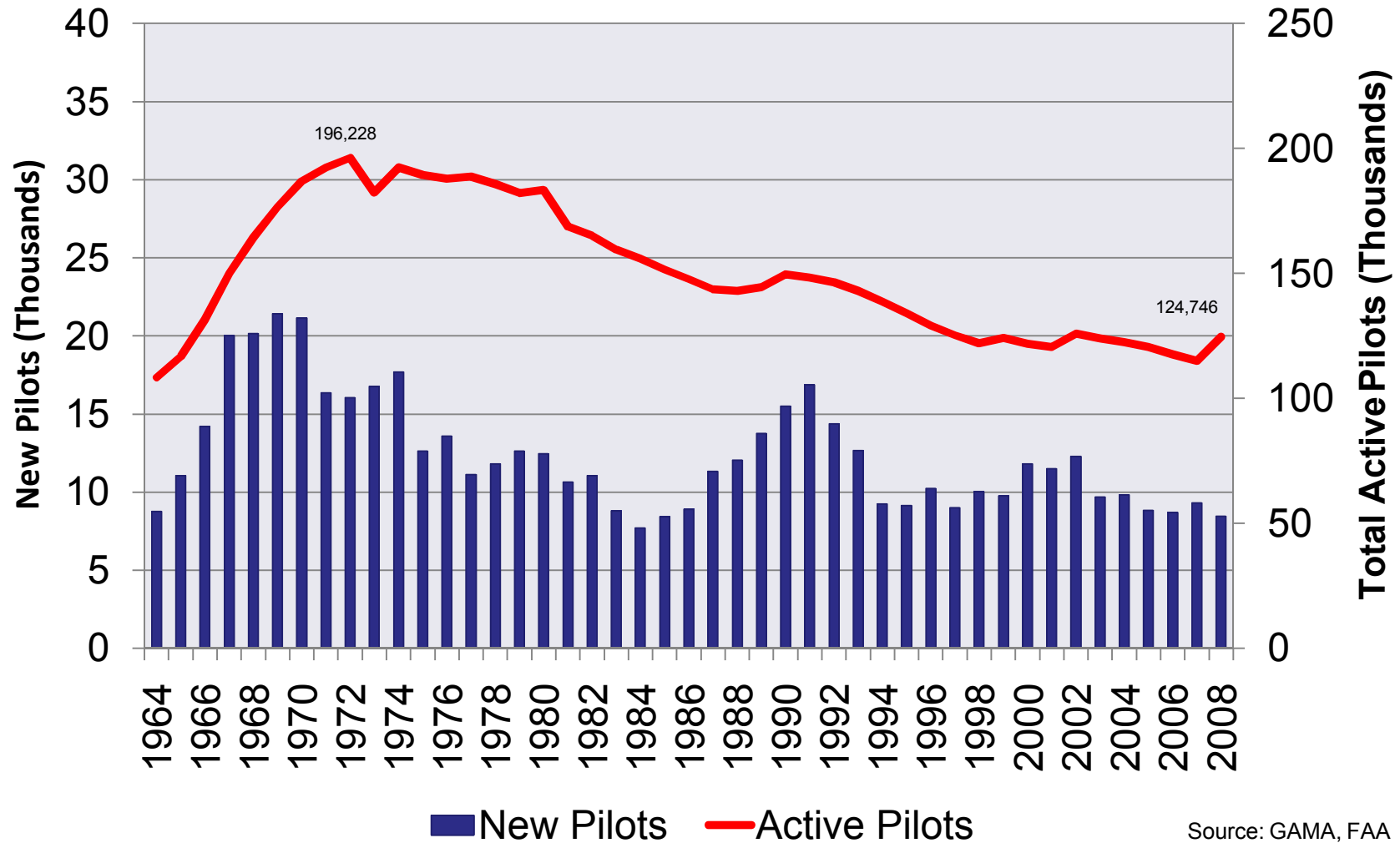
Sources: FltOps.com, GAMA



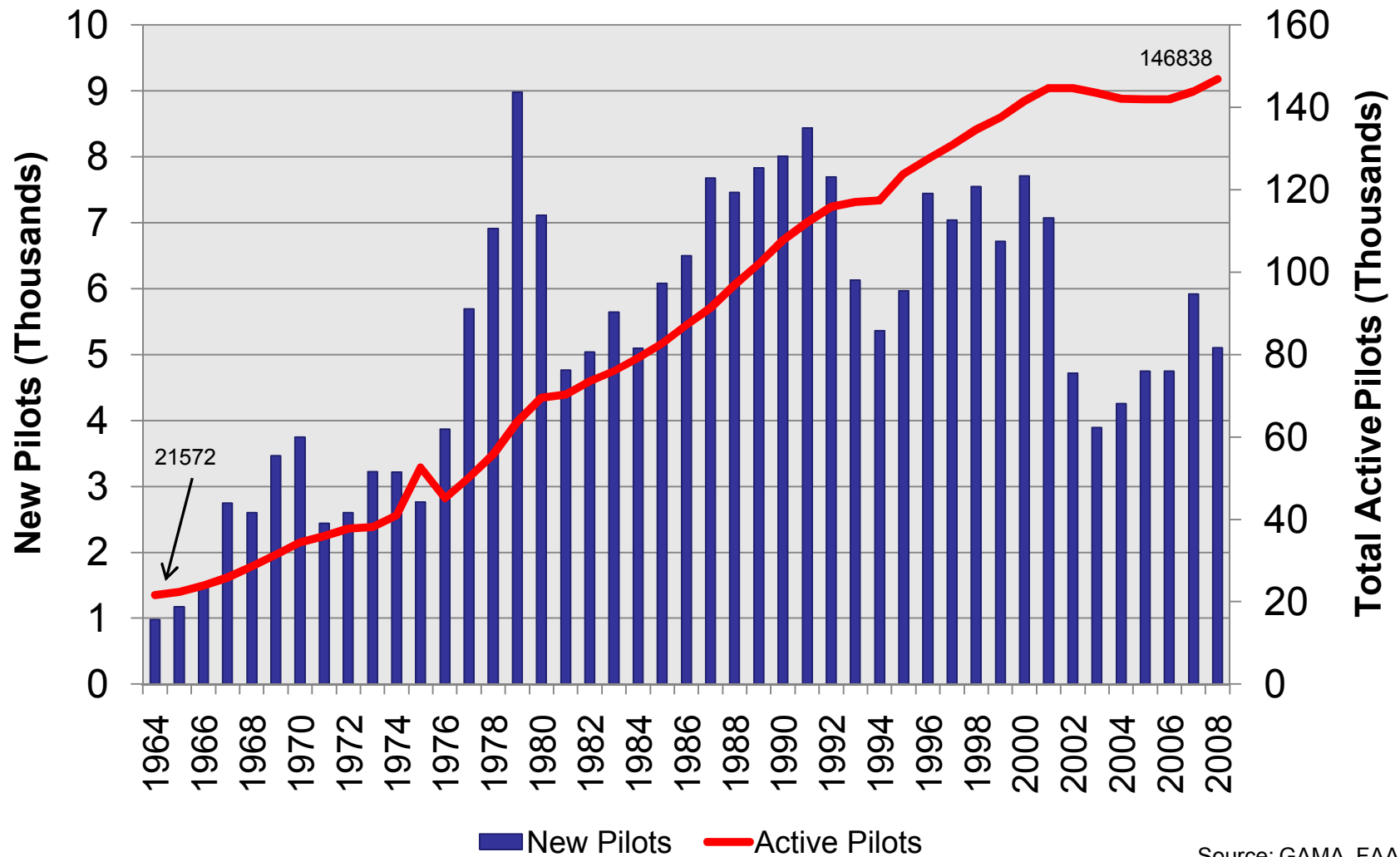
Historical Flight Costs vs. New Commercial Pilots Created 2 Years Later



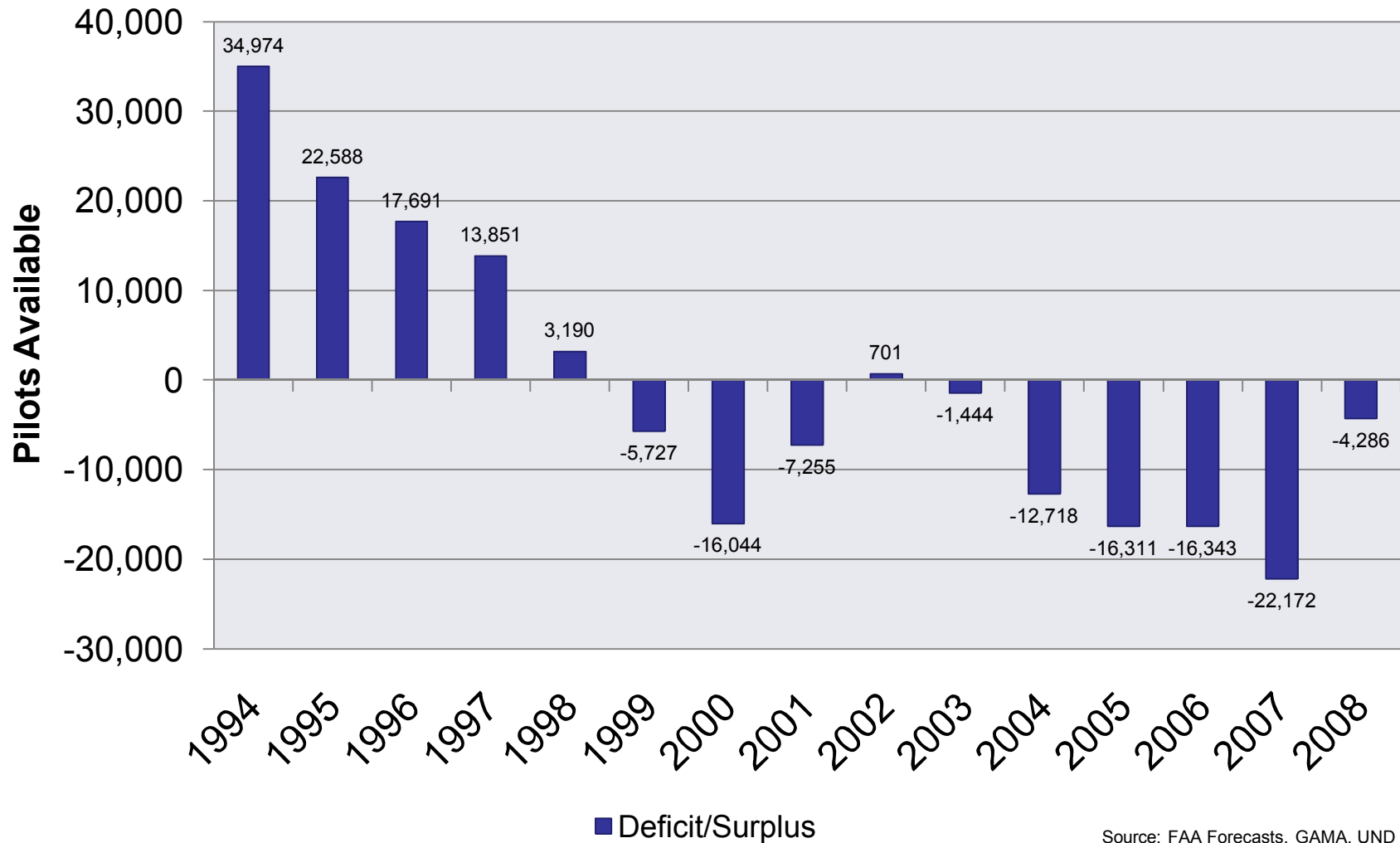
New and Active Commercial Pilots – Historical



New and Active ATP Pilots - Historical



Pilots Available to Staff Active Aircraft – Historical



Source: FAA Forecasts, GAMA, UND



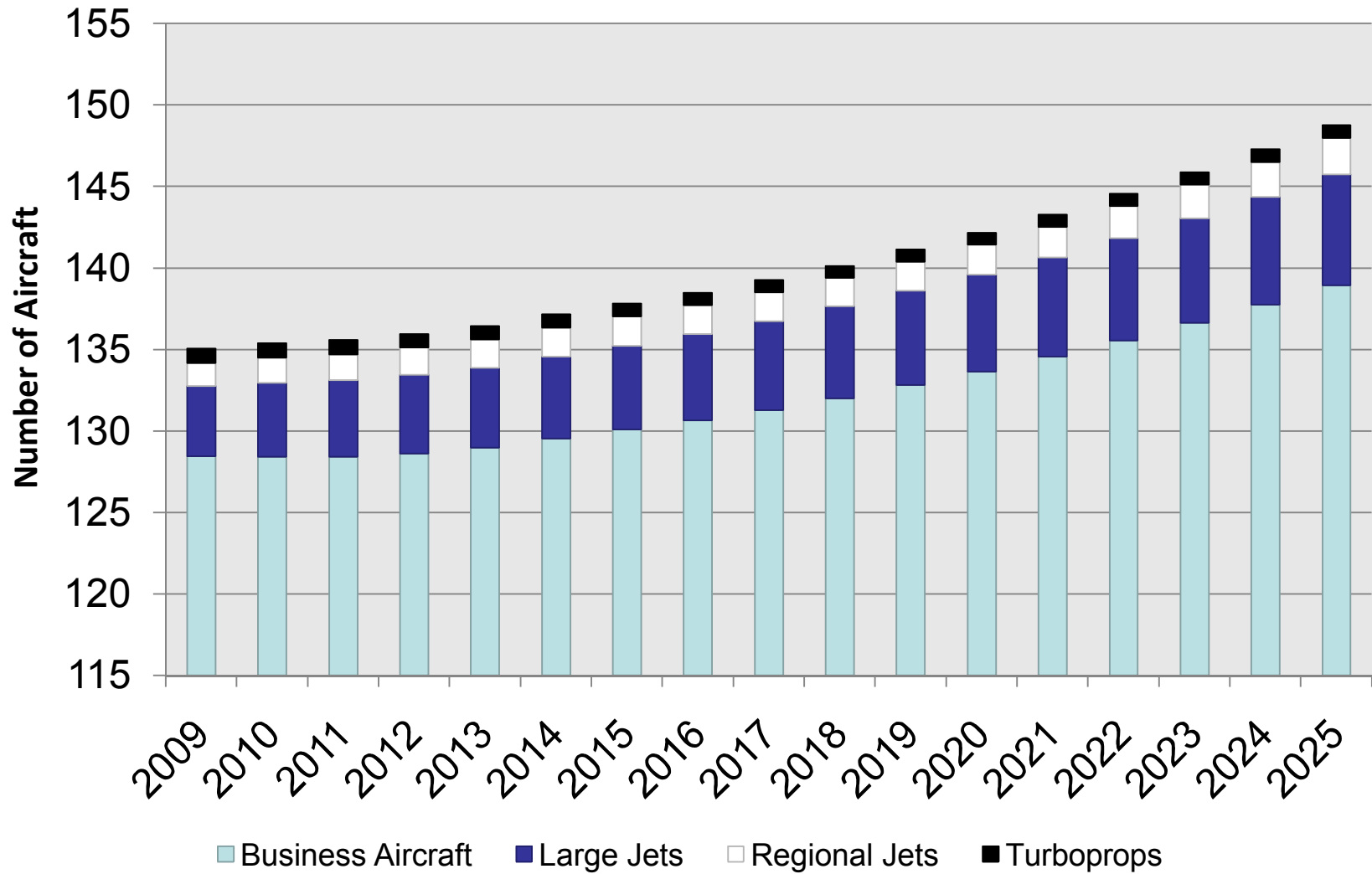
Forecast Pilot Hiring at Major Airlines 2010-2025



- Flight Training Costs Forecast Assumptions
 - Historically flight costs have climbed 1.28% above inflation (CPI)
 - Using the OMB outlook, CPI from 2008-2025 is forecast to be 1.9% annually
 - Therefore, a 3.18% cost growth factor was used for the duration of the supply forecast



FAA Forecast Active Aircraft 2009-2025



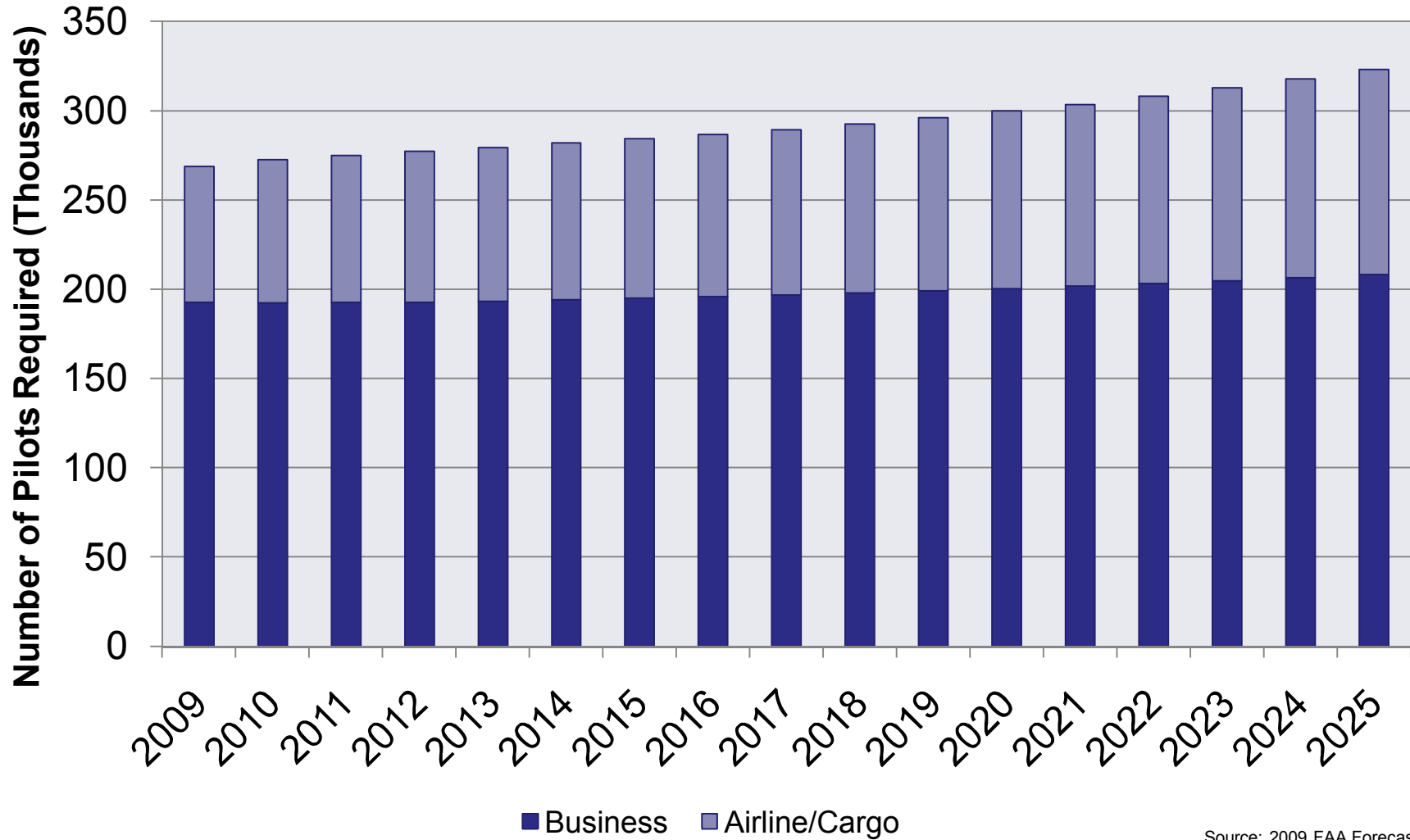
- Pilot Demand
 - Civilian pilots staff aircraft according to the following industry-aggregated ratios:

Type of Operation	Number of pilots/aircraft
Legacy and Major Airlines	12.65
Regional Jet Operators	9.73
Regional Turboprop Operators	8.60
Fractional Operators	6.34
Corporate/Business Operators	1.50*

Sources: 10-K Annual Reports, Company Literature
*Estimated due to ambiguous data and large variance



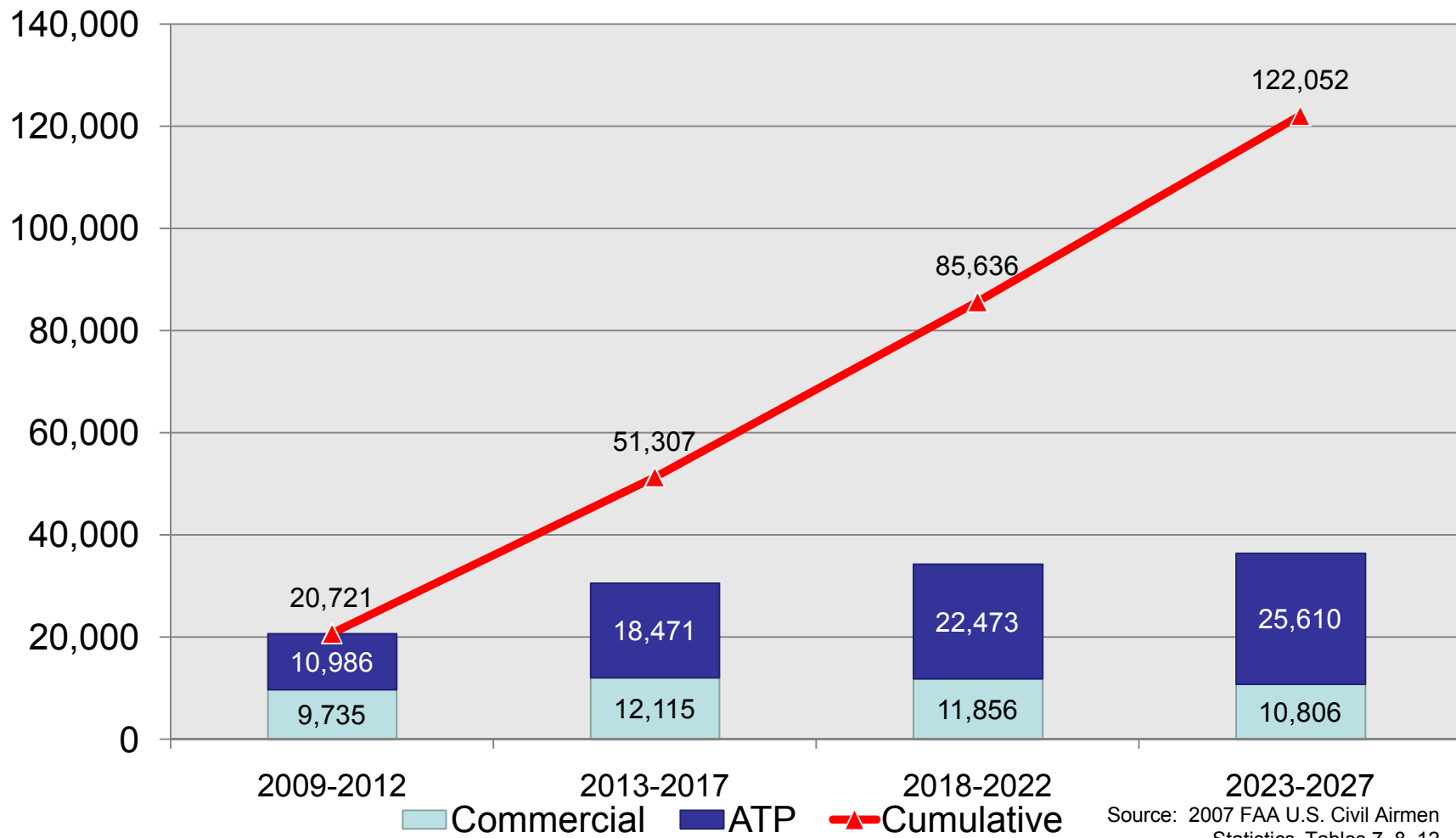
Forecast Pilot Demand for New Aircraft 2009-2025



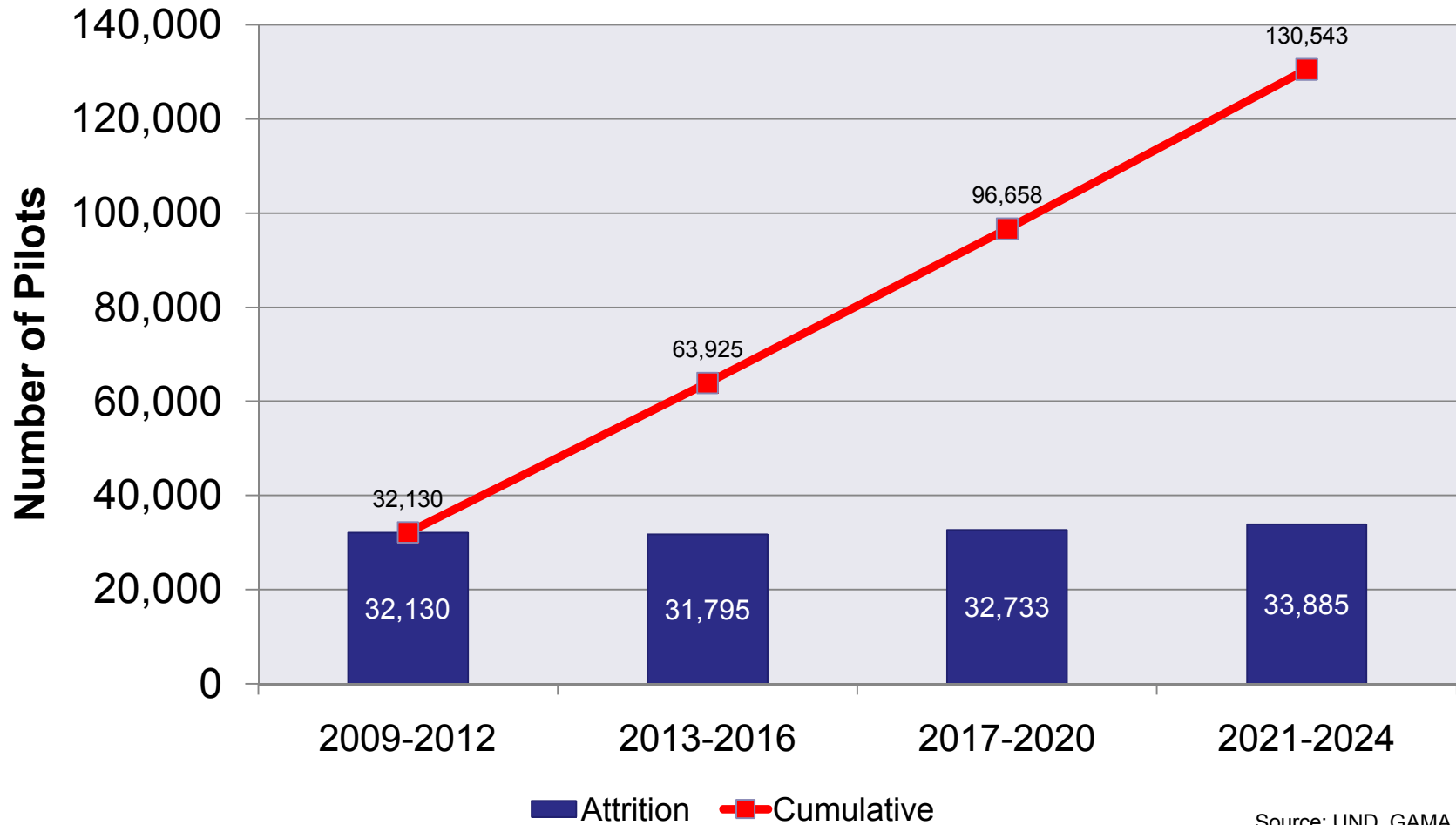
Source: 2009 FAA Forecast



Pilot Retirements Forecast 2009-2027 Unconstrained Age 65, Fixed Wing



Forecast Pilot Attrition Other than Retirement at 2.94% Annually 2009-2024



Source: UND, GAMA

